

## ABSTRACT

The invention is a plasma reactor employing a chamber having a process gas inlet and enclosing a plasma process region. The reactor includes a workpiece support pedestal within the chamber capable of supporting a workpiece at a processing location interfacing with the plasma process region, the support pedestal and the chamber defining an annulus therebetween to permit gas to be evacuated therethrough from the plasma process region. One aspect of the invention includes a ring horseshoe magnet adjacent and about one side of the annulus, the magnet being spaced from the plasma processing location by a spacing substantially greater than the smallest distance across the annulus. The invention further includes the magnet defining opposite poles which are substantially closer together than the spacing of the magnet from the processing location, the magnet being oriented to provide its maximum magnetic flux across the annulus and a minimum of the flux at the plasma processing location.